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Editorial

Education in anaesthesia. Changing a paradigm?☆

Educación en anestesia. ¿Cambio de un paradigma?

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The traditional way of teaching medicine and anaesthesia, consisting of daily clinical practice under the guidance of a tutor, has been effective over the years. However, the world of medicine has been changing, and the concept of learning with real patients with the potential of making mistakes is losing ground.[1]

There has been a recent paradigm shift in the way medicine and its different specialties are taught. Several factors explain this, including the changing role of patients who are no longer passive subjects unable to challenge decisions but have become independent individuals actively involved in their medical management with basic, although sometimes distorted, medical knowledge gained through the media and their access to different forms of information, mainly through the Internet. Moreover, patients are increasingly aware of the fact that medical students or "apprentices" as they are called colloquially, use them to practice on them what they learn in the classroom.[1]

Additionally, the medico-legal system, increasingly a part of medical practice, prompts patients to exercise their right to demand results and to file complaints when they are not satisfied or suffer a complication. This has created greater awareness among faculty members and particularly among undergraduate and graduate medical students of the lack of training in certain technical and clinical skills, and has also increased the fear of practicing on real patients with the possibility of making mistakes that may lead to serious harm and even death because of their lack of expertise, not to mention the ensuing malpractice lawsuits.[2]

Real patients are required at some point in medical education in order to help students refine their skills. However, there is always the moral obligation of providing optimal care and ensuring patient safety and wellbeing, and balancing these two needs is at the core of an ethical dilemma in medical education.[3] Simulation-based learning is designed to diminish this tension as it helps develop knowledge, skills and behaviours, while protecting patients from unnecessary risks. The ethical imperative of "first, do no harm" and the large epidemiological studies that describe avoidable and unacceptable harm for patients as a result of medical treatment provide the framework for the ethical analysis of simulation-based medical education: higher standards of care and training, error management, patient safety, patient independence, and social justice. The use of simulation whenever possible conveys an essential educational and ethical message: patients are to be protected at all times and must not be used as objects to facilitate medical training. According to Ziv,[3] incorporating simulation in undergraduate and graduate curricula is an ethical requirement in order to improve quality and safety in healthcare.

Different medical schools, led by their faculty, have stood up to the challenge, changing the way in which their students acquire their technical and clinical skills. As part of multiple curricular changes, simulation has gained significant importance as an attractive tool to train students without placing patients at risk. It is a means to simulate situations and even rare events, and provide as much repetition as is needed until students acquire the necessary technical and clinical skills before putting their knowledge to the test with real patients.

Simulation in medicine consists of creating as real as possible a scenario simulating a specific situation or procedure. Specific or virtual mannequins are used to replace the real patient, providing individual students or groups of students with the opportunity of receiving technical and attitudinal

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training as well as of trying new tools or devices. Additionally, undergraduate and graduate students can be assessed for skills and knowledge in a predetermined, controlled, safe and favourable learning environment.

This is by no means to suggest that simulation must take the place of clinical experience under tutor guidance, considered the mainstay of medical education. It must be seen as the bridge between theory and clinical practice, and not as a dichotomous teaching strategy but rather as a continuum in learning. In anaesthesia, simulation can be used to develop and practice skills in regular procedures, management of critical situations, leadership, team work, and even to expose students to rare events where they are expected to be the experts, before coming into contact with real patients.[2]

Modern simulation began in 1960 when doctors Safar y Lind, together with a toy manufacturer, developed "Resusci-Anne", a mannequin torso for training in cardiopulmonary resuscitation.[4] This simulator revolutionized training for medical students and specialists in this field, and later on for the general public. Since then, the development of different types of mannequins and more complex simulators has grown, offering new capabilities that reproduce, with very good fidelity, the physiological conditions of patients in different clinical situations.

Today, simulation is becoming part of all anaesthesia specialties, considering that proficiency comes with practice. Although, at first, simulation was used only to develop manual and technical skills, it is believed at present that simulated scenarios are very important for the acquisition of non-technical skills such as team work, communication among different specialties, leadership, decision-making in critical situations, and knowledge of different scenarios in order to plan and anticipate potential complications.

However, there is an important concern regarding the use of mannequins and virtual simulators to train students, and it has to do with dehumanized medical care provided by students who have become used to treating mannequins that cannot feel, speak or complain. It could happen that they would treat real patients the same way, not greeting them, communicating with them or explaining to them the procedure they will undergo. This is an important challenge in the practice of simulation and requires teaching students to be kind and caring, respecting the mannequin as if it were a real patient, and making sure that there is close follow-up of these behaviours once students begin their practice with real patients to ensure respect, communication and humane treatment at all times.

This issue of RCA brings two articles on the topic of anaesthesia training, one by doctor Uribe et al.[5] that refers to the use of a simulated scenario for testing the supraglottic laryngeal device (SALT) for airway management with medical students and first-aid staff with no medical training. The use of the simulated scenario helped the authors to suggest that the use of this device by people with little training, without the need to expose real patients to unnecessary risk, may be an effective option for pre-hospital airway management.

A very important component of anaesthesia education is the ability to use objective student evaluations through the use of learning curves, practice quality audits, and the construction of measurements for monitoring healthcare quality. Learning curves and the ability to recognize the number to times that a learner must repeat a procedure in order to reach adequate skill levels are of vital importance for several reasons.[6] For one thing, education institutions must be able to determine the number of students than can be enrolled and also to ensure that each of them will be exposed to a minimum number of procedures before reaching the required proficiency.[6]

CUSUM is an interesting tool in this regard, in terms of its retrospective application but also when used prospectively to build continuous quality indicators in anaesthesia education. It provides a means to objectively assess compliance with quality standards and minimum training requirements. In the second article published in this issue of *Revista Colombiana de Anestesiología*, doctor Aguirre et al.[7] explore the use of CUSUM in four graduate students in one of the anaesthesia schools in the country, with the creation of learning curves for six basic procedures in the practice of anaesthesia. The results are very interesting and lead to think about the possibility of setting up quality standards in the teaching of those procedures based on the experience in this country. However, the authors consider that it is important to conduct studies with a larger number of students before results can be generalized. It would be interesting to develop learning curves in our country for the different anaesthesia procedures using simulated settings in order to establish the required minimum and determine when a student is sufficiently proficient in a given procedure so as to go on to clinical practice with real patients.

Despite multiple publications available at the present time regarding education in anaesthesia, clinical simulation and methods such as learning curves for assessing results, there is little data in the medical literature to confirm improved healthcare outcomes as a result of the use of simulation for training individuals and teams.[2]

The limitations of simulation are, above all, the economic cost of creating the adequate simulation environment for particular situations, and the need for protected time and training afforded to faculty members so that they can incorporate that form of teaching on top of their clinical practice. The different education institutions must prioritize simulation and work towards the creation of multidisciplinary simulation centres, and study the benefits for the students as well as for the institution.[1]

It is expected that with increasingly affordable models, a growing number of medical schools and, in particular, anaesthesia programmes, will include this practice in their curricula and produce additional evidence about its use.

Simulation is a new tool that must gradually become part of anaesthesia residency courses because it has been shown to improve learning and retention of that learning, allowing students to become proficient without placing patients or physicians at risk, and minimizing the ethical dilemmas created by the practice of using patients for learning.

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Conflicts of interest

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